

## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) A method to produce uranium dioxide fuel in pellet shape for use in a light water reactor, comprising:

providing an arrangement, comprising porous uranium dioxide;

infiltrating the porous uranium dioxide with a precursor liquid;

then curing the arrangement, comprising the porous uranium dioxide infiltrated with the precursor liquid; and

thermally firing the arrangement, comprising the porous uranium dioxide, such that the precursor liquid is converted to a second phase, wherein the fired arrangement has a higher thermal conductivity than the arrangement without infiltration of the uranium dioxide with the precursor liquid.

2. (Original) The method according to claim 1, wherein the precursor liquid is allylhydridopolycarbosilane.

3. (Cancelled).

4. (Original) The method according to claim 1, wherein the second phase is a solid.

5. (Cancelled).

6. (Previously Presented) The method according to claim 1, wherein the curing of the arrangement is between 180 and 400 degrees centigrade.

7. (Previously Presented) The method according to claim 1, wherein the firing of the arrangement is between 850 degrees centigrade and 1700 degrees centigrade.

8. (Previously Presented) The method according to claim 7, wherein the firing of the arrangement is between 1500 degrees centigrade and 1700 degrees centigrade.

9. (Original) The method according to claim 1, wherein the arrangement is provided in pellet form.

10. (Previously Presented) The method according to claim 1, wherein the thermal firing of the porous uranium dioxide arrangement results in solid silicon carbide.

11. (Currently Amended) The method according to claim 1, wherein the method is repeated until a the thermal conductivity of the fuel arrangement is increased about 50 percent for a 10 percent volume loading of the second phase compared to that of a fuel arrangement formed from conventional uranium dioxide.

12. (Original) The method according to claim 1, wherein the infiltrating of the porous uranium dioxide arrangement with the precursor liquid results in incorporation of the precursor liquid into a center of the uranium dioxide arrangement

13. (Withdrawn) A nuclear fuel, comprising:

an arrangement having a matrix of uranium dioxide; and

silicon carbide interspersed in the matrix of uranium dioxide.

14. (Withdrawn) The nuclear fuel according the claim 13, wherein the arrangement is pellet shaped.

15. (Withdrawn) The nuclear fuel according to claim 13, wherein a total volume of the arrangement is comprised of up to 10% silicon carbide on a volumetric basis.

16. (Withdrawn) The nuclear fuel according to claim 15, wherein the silicon carbide is equally interspersed with the uranium dioxide.